UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,083	01/14/2004	Kensuke Sawada	FUJI 20.849	3461

26304 7590 05/29/2008

KATTEN MUCHIN ROSENMAN LLP
575 MADISON AVENUE
NEW YORK, NY 10022-2585

EXAMINER	
FOTAKIS, ARISTOCRATIS	
ART UNIT	PAPER NUMBER
2611	
MAIL DATE	DELIVERY MODE
05/29/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/757,083	SAWADA, KENSUKE	
	Examiner	Art Unit	
	ARISTOCRATIS FOTAKIS	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04/23/2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3 - 4, 6 - 10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *6* is/are allowed.

6)☒ Claim(s) *3 - 4, 7 - 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 8 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Mohseni et al. (US 6,535,562).

Re claim 8, Mohseni teaches of a digital baseband modulation apparatus, comprising: a spread modulation unit (complex multiplier, #102, Fig.8) for complex spreading an I component signal (I data signal, Fig.8, #12a) and a Q component signal (Q data signal, Fig.8, #12b) of a transmit signal by using spreading code for I axis (I PN code, Fig.8, #22a) and spreading code for Q axis (Q PN code, Fig.8, #22b) so as to output an output signal comprising an output I component signal (#32a, Fig.8) and an output Q component signal (#32b, Fig.8); and an amplitude control unit that decreases the amplitude component of the output signal by a predetermined factor (factor of $\sqrt{2}$) when the output signal is output on the I axis or on the Q axis (Col 7, Lines 40 – 55,

Fig.12A to 12B) and does not decrease the amplitude component of the received signal by the predetermined factor when the received signal is neither on the I axis nor on the Q axis (*As shown in Figs.12A and 12B, only the points that are on the I and Q axis are decreased*); and a quadrature modulation unit (Fig.4).

Re claim 9, Mohseni teaches of wherein the spread modulation unit comprises a phase rotation unit that rotates the phase angle of the output signal according to a control from the outside (Col 5, Lines 47 – 64, Fig.6A to Fig.6B).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3 - 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mohseni et al. (US 6,535,562) in view of Chouly (US 5,504,775).

Re claim 3, Mohseni teaches of a digital baseband modulation apparatus, comprising: a spread modulation unit (complex multiplier, #102, Fig.8) for complex spreading an I component signal (I data signal, Fig.8, #12a) and a Q component signal (Q data signal, Fig.8, #12b) of a transmit signal by using spreading code for I axis (I PN code, Fig.8, #22a) and spreading code for Q axis (Q PN code, Fig.8, #22b) so as to output an output signal comprising an output I component signal (#32a, Fig.8) and an output Q component signal (#32b, Fig.8); and an amplitude control unit that decreases the amplitude component of the output signal by a predetermined factor (factor of $\sqrt{2}$) when the output signal is output on the I axis or on the Q axis (Col 7, Lines 40 – 55, Fig.12A to 12B) and does not decrease the amplitude component of the received signal by the predetermined factor when the received signal is neither on the I axis nor on the Q axis (*As shown in Figs.12A and 12B, only the points that are on the I and Q axis are decreased*); and a quadrature modulation unit (Fig.4). However, Mohseni does not teach of a receiver that performs the reverse procedure of the signal being transmitted.

Chouly teaches of a multi-user spread spectrum transmitter where the receiver performs the reverse operations to those performed at the transmitter end (Col 4, Lines 64 – 65).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a CDMA receiver that would perform the transmitting process in a reverse order by multiplying the amplitude of the signal component by the inverse of the amplitude reduction factor of Mohseni to reproduce the signal for simplicity reasons.

Re claim 4, Mohseni and Chouly teach all the limitations of claim 3 as discussed as well as Chouly teaching of a receiver performing reverse operation of a CDMA transmitter as discussed above. Mohseni teaches of the spread modulation unit further comprising a phase rotation unit that rotates the phase of the complex spread signal according to a control from the outside (Col 5, Lines 47 – 64, Fig.6A to Fig.6B).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a CDMA receiver of Chouly that would perform the transmitting process in a reverse order by performing the reverse of phase rotation of the transmitting apparatus of Nagatani to reproduce the signal for simplicity reasons.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mohseni in view of Yanagi (6,625,173) and in further view of Chouly (US 5,504,775).

Re claim 7, Mohseni teaches of a digital baseband modulation apparatus, comprising: a spread modulation unit (complex multiplier, #102, Fig.8) for complex spreading an I component signal (I data signal, Fig.8, #12a) and a Q component signal (Q data signal, Fig.8, #12b) of a transmit signal by using spreading code for I axis (I PN code, Fig.8, #22a) and spreading code for Q axis (Q PN code, Fig.8, #22b) so as to output an output signal comprising an output I component signal (#32a, Fig.8) and an output Q component signal (#32b, Fig.8); and an amplitude control unit that decreases the amplitude component of the output signal by a predetermined factor (factor of $\sqrt{2}$) when the output signal is output on the I axis or on the Q axis (Col 7, Lines 40 – 55, Fig.12A to 12B) and does not decrease the amplitude component of the received signal by the predetermined factor when the received signal is neither on the I axis nor on the Q axis (*As shown in Figs.12A and 12B, only the points that are on the I and Q axis are decreased*); and a quadrature modulation unit (Fig.4). However, Mohseni does not teach of a system applied to multiple users and does not teach of a receiver that performs the reverse procedure of the signal being transmitted.

Oishi teaches of a digital baseband modulation apparatus, comprising a plurality of pairs of a spread modulation part (Code-multiplexed signal generator, 71_1 – 71_n, Fig.2) and an amplitude conversion unit (signal-peak suppression unit, Fig.2), each pair receiving a transmit signal (Fig.2, D_1 – D_n), wherein the spread modulation part complex

spreads an I component signal (D_{i1}-D_{in}, Fig.2) and a Q component signal (D_{q1}-D_{qn}, Fig.2) of the transmit signal by using spreading code for I axis (C_{i1}-C_{in}, Fig.2) and spreading code for Q axis (C_{q1}-C_{qn}, Fig.2) so as to output an output signal comprising an output I component signal (output to 81_i) and an output Q component signal (output to 81_q) (Col 7, Lines 64 – 67 to Col 8, Lines 1 – 36, Fig.2); and the amplitude conversion unit decreases the amplitude component of the output signal by a damping factor α when the output signal is output on the I axis or on the Q axis (Col 8, Lines 37 – 67 to Col 9, Lines 1 - 24, Fig.2 - 4); the digital baseband modulation apparatus further comprising: a duplexing unit (#55, quadrature modulator, Fig.2) for duplexing output signals output from the amplitude conversion parts (#52, Fig.2) by linearly adding the output signals. Oishi also teaches of a receiver which includes a separating unit that spreads the IQ signal output into separated IQ signals; and despread demodulation units that receive each pair of the separated IQ signals (Fig.26).

However, Oishi does not specifically teach of a receiver that performs the reverse procedure, of his invention, of the signal being transmitted.

Chouly teaches of a multi-user spread spectrum transmitter where the receiver performs the reverse operations to those performed at the transmitter end (Col 4, Lines 64 – 65).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a multi user system to enhance the capacity and performance of CDMA. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a CDMA receiver that would perform

the transmitting process in a reverse order by multiplying the amplitude of the signal component by the inverse of the amplitude reduction factor of Mohseni, perform the reverse operation of Oishi multi-user transmitting apparatus to reproduce the signal for simplicity reasons.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (US 6,882,636) in view of Mohseni et al and further in view of Watanabe et al. ("High speed radio communication technology using parallel combinatory CDMA under multipath Rayleigh-fading interference environment", Telecom Res. Lab., Matsushita Commun. Ind. Co. Ltd., Yokohama, 1996 IEEE).

Kim discloses of a digital baseband modulation apparatus, comprising a plurality of pairs of a spread modulation part, each pair receiving a transmit signal, wherein the spread modulation part (#214, #222, #235, #236, #237, #238, Fig.2)) complex spreads an I component signal and a Q component signal (from #213, #233, #234, Fig.2) with respect to the transmit signal by using spreading code for I axis and spreading code for Q axis (channelization codes, C_{ch1}, C_{ch2}, C_{ch3}) so as to output an output signal comprising an output I component signal and an output Q component signal (to the summers, #215, #223, Fig.2); the digital baseband modulation apparatus further comprising: a duplexing part for duplexing output signals output from the amplitude conversion parts by linearly adding the output signals (#215, #223, Fig.2); and a switch part for switching between the transmit signals and received low speed channel signals

to input the separated signals or the received low speed channel signals into the spread modulation parts (signal 1 – 3 and TFCI bits 1 - 3, #212, #242, #252, Fig.2, Col 1, lines 55 – 67 to Col 2, Lines 1 - 31).

However, Kim does not teach of an amplitude conversion part decreases the amplitude component of the output signal by a predetermined factor when the output signal is output on the I axis or on the Q axis, and does not decrease the amplitude component of the output signal by the predetermined factor when the output signal is output neither on the I axis nor on the Q axis and a separation part for separating a received high speed channel signal into a plurality of separated signals to be input into the spread modulation parts.

Mohseni teaches of a digital baseband modulation apparatus, comprising: a spread modulation unit (complex multiplier, #102, Fig.8) for complex spreading an I component signal (I data signal, Fig.8, #12a) and a Q component signal (Q data signal, Fig.8, #12b) of a transmit signal by using spreading code for I axis (I PN code, Fig.8, #22a) and spreading code for Q axis (Q PN code, Fig.8, #22b) so as to output an output signal comprising an output I component signal (#32a, Fig.8) and an output Q component signal (#32b, Fig.8); and an amplitude control unit that decreases the amplitude component of the output signal by a predetermined factor (factor of $\sqrt{2}$) when the output signal is output on the I axis or on the Q axis (Col 7, Lines 40 – 55, Fig.12A to 12B) and does not decrease the amplitude component of the received signal by the predetermined factor when the received signal is neither on the I axis nor on the

Q axis (*As shown in Figs.12A and 12B, only the points that are on the I and Q axis are decreased*); and a quadrature modulation unit (Fig.4)

Watanabe teaches of multicode transmission, wherein the high speed input is split into several low speed signal streams, and each low speed signal stream then treated as a regular DS-CDMA signal in order to accommodate users with high rates of data transmission in a CDMA system (Page 407, System Structure).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used an amplitude conversion part in order to avoid DAC saturation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a high speed to low speed S/P converter to convert the transmission signal into a plurality of low speed signals in order to accommodate users with high rates of data transmission in a CDMA system to be able to tolerate multipath fading.

Allowable Subject Matter

Claim 6 is allowed.

Response to Arguments

Applicant's arguments filed April 23, 2008 have been fully considered but they are not persuasive.

Applicants submit that the combination of Mohseni and Chouly fail to disclose or suggest the amended claimed features of increasing "the amplitude component of the received signal when the received signal is on the I axis or on the Q axis," and not increasing the amplitude component of the received signal by the predetermined factor when the received signal is neither on the I axis nor on the Q axis.

Examiner submits that Mohseni teaches of amplitude reduction on the signal that is on the I axis or on the Q axis as shown in Fig.12B. However, Fig.12A or Fig.12B does not show the presence of any signal that is neither on the I axis nor on the Q axis and the teaching does not show that amplitude reduction is performed on those points. Furthermore, the claim does not require that the signal needs to exist on neither the I axis nor on the Q axis.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aristocratis Fotakis whose telephone number is (571) 270-1206. The examiner can normally be reached on Monday - Thursday 6:30 - 4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aristocratis Fotakis/

Examiner, Art Unit 2611

/CHIEH M FAN/

Supervisory Patent Examiner, Art Unit 2611